Statewide Water Analysis Network

A Technical Advisory Group for the next California Water Plan Update

December 7, 2006

Workshop Objectives

- Describe Statewide Water Analysis Network (SWAN) and its roles in the next CWP Update
- Provide context of today's workshop as it relates to previous CWP activities
- Discuss our recommended approach to select, improve, and develop analytical tools to produce quantitative deliverables for future CWP Updates
- Present findings of pilot study designed to answer the question: "Are object-oriented modeling techniques and visual modeling tools effective to use in a shared vision planning approach related to the California Water Plan?"
- Get feedback from SWAN members regarding recommendations

SWAN Formation

- What is SWAN
  - Purpose, Participation, Commitments, etc
- Improving Analytical Tools and Data for Statewide and Regional Planning
  - Where we are, where we want to be, how to get there

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What is SWAN

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Purpose

- Primary technical advisory group for the California Water Plan
  - Provide recommendations on improvements to analytical tools and data
  - Through Water Plan, recommendations will guide other statewide and regional planning efforts
  - Provide feedback on proposals by Water Plan team

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California Water Plan Update
Project Organization and Public Process

DRAFT

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Updated 10-24-2006

Why a Network?

- Problems identified for Water Plan are not unique
- Solution requires better integration and consistency at federal, state, regional, and local scales
- We have had difficulty reaching consensus on quantitative deliverables
- Expertise and funding are diffuse

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How SWAN Can Help

- Help to build common conceptual understanding of water management system
- Identify appropriate scales for Water Plan analysis
- Develop strategy for making water planning information transparent
- Develop guidelines for integrating information

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1) Conceptualize Water Management System

- Critical factors related to water demands
  - Population, land use, housing mix, employment, etc
- Water supplies, water use efficiency, water quality, ecosystem functions, economic markets, etc
- Quantify interactions between components

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2) Identify Appropriate Scales for Water Plan Analysis

- Planning, temporal, spatial, policy
  - CWP is not a feasibility study
  - Planning horizon at 25, 50, or 100 years
  - Weekly, monthly, seasonal, or yearly
  - Water district, county, Planning Area, or Hydrologic Region

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3) Develop Strategy for Making Water Planning Information Transparent

- Shared Vision Planning
- CWEMF model development principles
- Improve data sharing technologies
  - Water Plan Information Exchange

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Principles for Development and Use of Analytical Tools (CWEMF)

- Strategy
- Transparency
- Technical Sustainability
- Coverage
- Accountability and Quality Control

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4) Develop Guidelines For Integrating Information

- Better integration needed across planning processes
  - CALFED Programs
  - Urban Water Management Plans
  - Agricultural Water Management Plans
  - Integrated Regional Water Management Plans (Proposition 50)
  - Groundwater Management Plans
  - And so on ...

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Desired Participation

- Federal, State, and local agencies
- Non-governmental organizations
  - CWEMF, Environmental
- University faculty and students
- Indian tribes
- Technical consultants
- Facilitation

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Needed SWAN Expertise

- Estimating future agricultural, urban, and environmental water demand
- Estimating future management responses
- Considering uncertainty about future climate conditions
- Identifying relationships between management of water, water quality, and energy
- Data management, visualization, and exchange

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Institutional Network Options (CWEMF)

- Consortium of agencies
- Independent R&D hosted by UC or other
- State modeling program (e.g. Texas)
- MOU of Modeling BMPs
- CBDA analysis coordination group
- Legislative req'ts linked to funding
- Reorganization of DWR
- DWR analysis coordinator and committee

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November 2005 workshop

- Attended by over 20 experts in data management and analytical tools
- Representatives of federal, State, local agencies, nongovernmental and academic organizations
- Discussed SWAN concept
- Reviewed work and findings by CWEMF from Strategic Analysis Framework report (September 2005)

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November 2005 workshop
Key Outcomes

- Participants generally agreed that California could benefit from SWAN
- Recommended DWR convene specific pilot projects of limited scope to test
- Recommended that initial participation be ad hoc
- Decide later if necessary to formalize
- Report back to stakeholder groups

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Pilot Studies

- Southern California Water Demand Study – RAND/UCSB (Completed June 2006)
- WEAP Climate Change and Decision Making under Uncertainty – IEUA / RAND (Dec. 2006)
- WEAP Climate Change Sac Valley – DWR / NHI / SEI / NCAR / USEPA (Dec. 2006)
- Integrating UWMP's with Water Plan – TBD (2007)
- Common Schematic – UC Davis, 1st Phase (Sept. 2008)
- Common Conceptual Design using Object Oriented Modeling – DWR / Ken Kirby (Apr 2007)

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Your Benefit-Cost Ratio = Reward/Time Commitment

- Reward
  - Opportunity to steer direction of analytical tool and data development for California water planning
  - Influence policy discussions by Water Plan Advisory Committee
  - SWAN participants will be listed in the Water Plan credits
- Time Commitment
  - SWAN is voluntary
  - 8 hours a month plus travel

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Discussion

- Proposing to continue direction from November 2005 workshop
  - Use ad hoc groups
  - Focus on a few pilot studies
- Questions or suggestions about SWAN
- Will you participate?
- Who else should participate?

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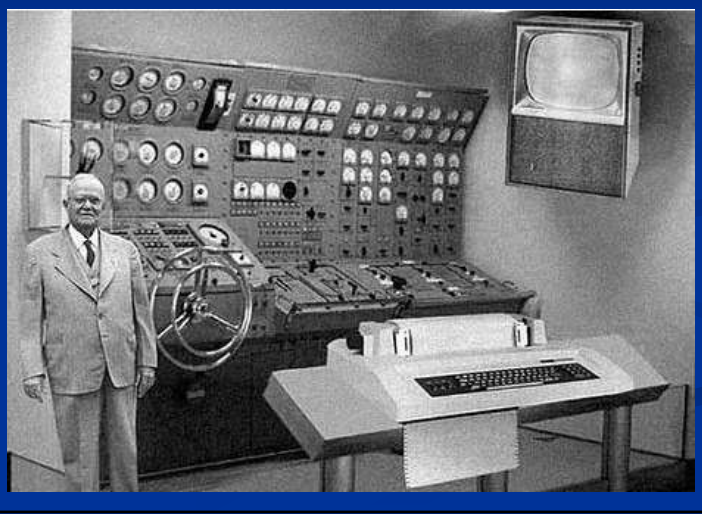
Improving Analytical Tools and Data For Statewide and Regional Water Planning



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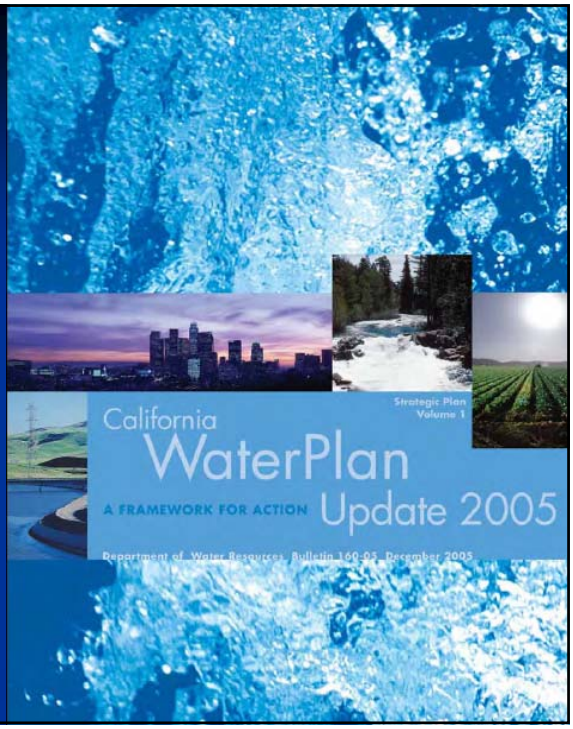
Outcomes of California Water Plan Update 2005



Recommendation 11
2005 California Water Plan

"DWR and other state agencies must improve data, analytical tools, and information management and exchange needed to prepare, evaluate, and implement regional integrated resource plans and programs in cooperation with other federal, tribal, local, and research entities"

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Identified Limitations In Water Plan Analysis

- No broad acceptance of prior analytical procedures
- Need detailed quantitative information about the costs, benefits, and broad social, environmental, and economic tradeoffs
- Data, analytical tool development, and data management have not kept pace
- Lack a consistent framework and standards for collecting, managing, and accessing data

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Specific Problem Areas

- Data, data, data
- Water flow and operations models
- Future water use forecasts
- Scenarios
- Consumptive vs. non-consumptive use
- Economic efficiency
- Hydrologic variability
- Water quality
- Planning objectives
- Groundwater management
- Transparency

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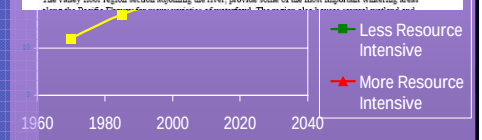
New Features

- Water Portfolios
  - Over 80 data categories of water supply & quality for 1998, 2000 & 2001
- Regional Reports
  - For 10 hydrologic regions, the Delta, and Mountain Counties
- Multiple Future Scenarios
  - Plausible yet different base conditions to plan for uncertainties
- 25 Resource Management Strategies
  - Tools for water managers & resource planners

cold, wet winters with large amounts of snow providing runoff for summer water supplies. The Sacramento Valley floor has mild winters with less precipitation and hot dry summers. Overall annual precipitation in the region generally increases as you move from south to north and west to east. The heavy snow and rain that falls in this region contributes to the overall water supply for the entire state.

The many rivers and streams that are tributary to the Sacramento River provide important riparian habitat that is critical for many aquatic and terrestrial species including the spring-run Chinook salmon (Oncorhynchus tshawytscha), winter-run Chinook salmon (Oncorhynchus tshawytscha) and Central Valley steelhead (oncorhynchus mykiss). This region is the only known area for the winter-run Chinook. The valley floor region section adjoining the river, provide some of the most important wintering areas



Stewardship

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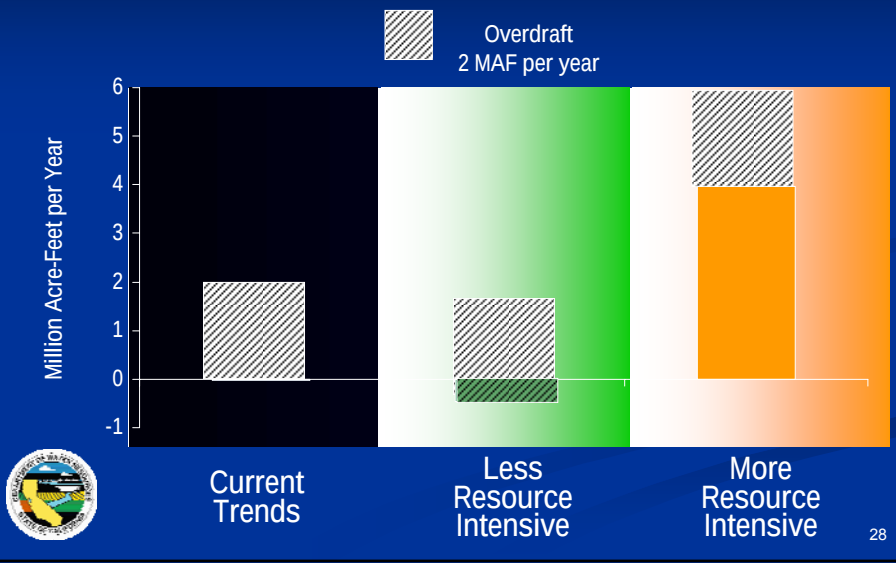
Scenario Demand Changes Statewide Plus Groundwater Overdraft



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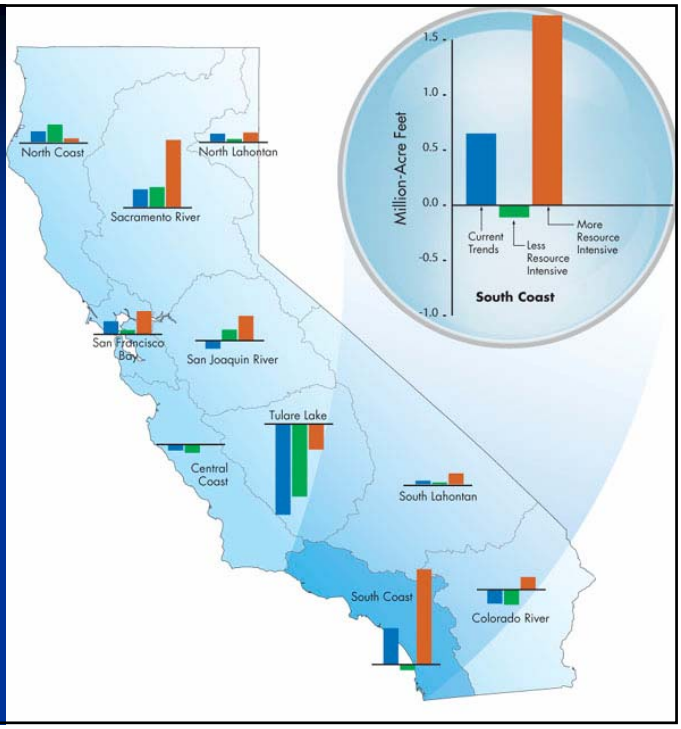
Scenario Demand Changes by Region



Resource Management Strategies

Reduce Water Demand
- Agricultural Water Use Efficiency
- Urban Water Use Efficiency

Improve Operational Efficiency & Transfers
- Conveyance
- System Reoperation
- Water Transfers

Increase Water Supply
- Conjunctive Management & Groundwater Storage
- Desalination –Brackish & Seawater
- Precipitation Enhancement
- Recycled Municipal Water
- Surface Storage – CALFED
- Surface Storage - Regional/Local

Improve Water Quality
- Drinking Water Treatment and Distribution
- Groundwater/Aquifer Remediation
- Matching Quality to Use
- Pollution Prevention
- Urban Runoff Management

Practice Resource Stewardship
- Agricultural Lands Stewardship
- Economic Incentives (Loans, Grants, and Water Pricing)
- Ecosystem Restoration
- Floodplain Management
- Recharge Areas Protection
- Urban Land Use Management
- Water-Dependent Recreation
- Watershed Management

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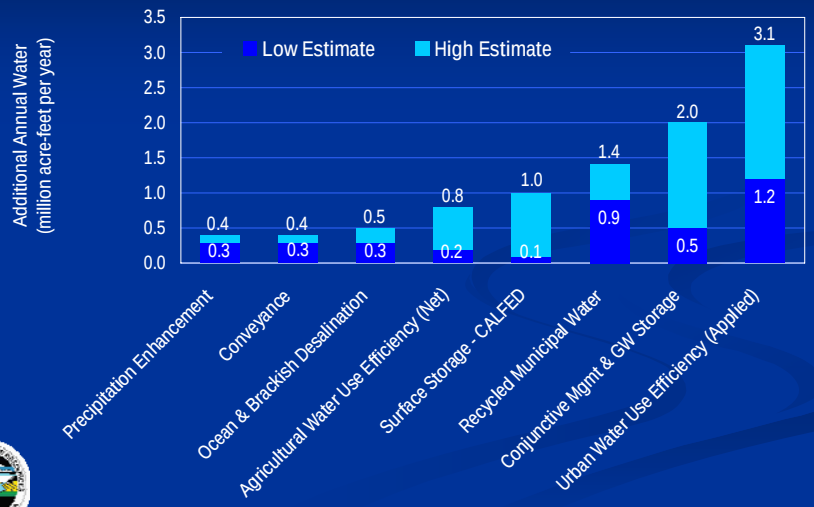
Range of Additional Water by 2030 for Eight Resource Management Choices



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Update 2005 Parking Lot (items not addressed)

- More local detail for Regional Reports and Water Portfolios
- More groundwater information
- Roll-up Urban Water Management Plans
- Include climate change, water quality, and energy relationships
- Improve rep. of environmental water
- Improve data QA/QC, transparency

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Where We Want To Be

Multiple Quantitative Views

- ***Water Portfolios***
  - Describe where water originates, where it flows, and what it is used for based on recent data
- ***Future Baseline Scenarios***
  - Describe expected changes by 2030 if water managers do not take additional action
- ***Alternative Response Packages***
  - Describe packages of promising actions, predict expected outcomes, and compare performance under each scenario

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The Point

- Multiple views of water management system will:
  - Help inform policy discussions
  - Promote rational decisions regarding investments to meet objectives
  - Support regional planning
  - Support statewide planning

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Analysis in Phases

Update 2005

- Water portfolios of current conditions
- Describe quantitative approach
- Illustrate part of the approach – future scenarios

Future Updates

- Refine quantitative approach
- Refine future scenarios
- Quantify response packages
- Compare performance

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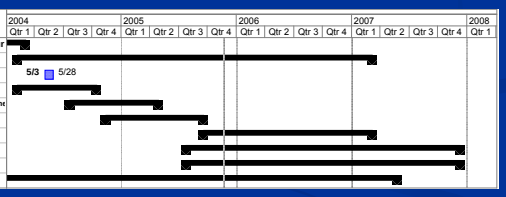
Strategy Proposed in Update 2005

ID	Task Name
1	**Analytical Tools and Data Tasks for Phase 1 of CWP (Resour**
14	**Analytical Tools and Data Tasks for Phase 2 of CWP**
15	Revise Analytical Tools workplan based on CWP Phase 1 comments
16	**Develop Conceptual Model**
27	**Develop Theoretical Models for Short-term and Long-term Approachs**
36	**Develop short-term approach (workshops as needed)**
43	**Develop long-term approach**
51	**Analytical Tools Tasks for Phase 3 of CWP**
52	**Conduct analysis for CWP Update 2008**
60	**Develop Water PI and Water Data Library to Assist Regional Planning**



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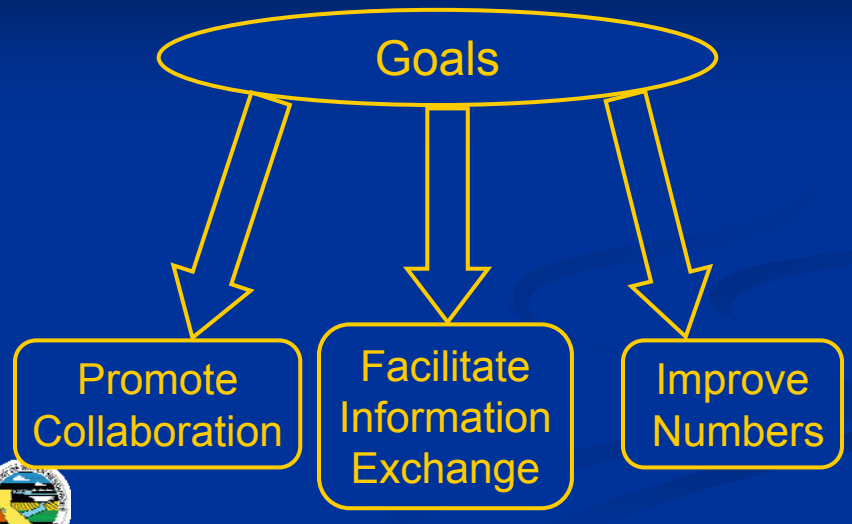
Next Steps for Quantitative Information



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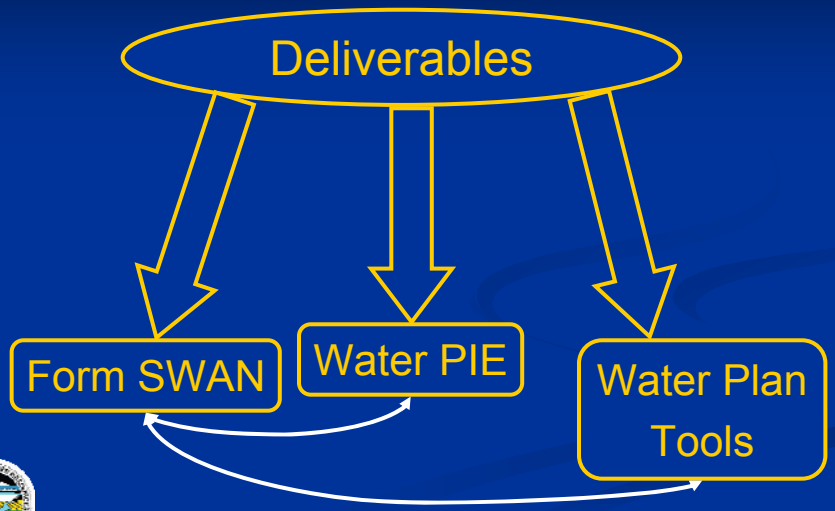
Next Steps for Quantitative Information



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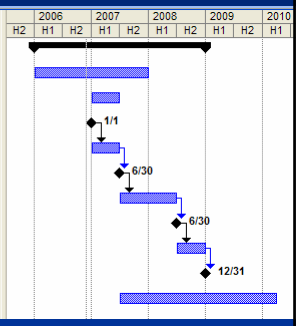
Proposed Schedule

Next Steps for Improving Quantitiaive Information
Develop Approach and Perform Quantitative Analysis for Next CWP
SWAN pilot studies
Consider results of SWAN pilot studies for CWP proposal
Results of IEUA study available
Develop proposal for next CWP through SWAN
Final proposal for next CWP
Regional data collection, model set up, and scenario runs
Initial results of scenario runs available for PRD
Refinement of scenario runs for PRD
Public Review Draft of CWP
Develop and implement contracts for longer term improvements



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Activities Over Next 6 Months

- Present results of completed pilot projects to SWAN
- Work with SWAN on implementing other pilot studies
- Conceptualize water management system
- Make proposal to SWAN on quantitative deliverables for the next Water Plan Update
- Work with SWAN to scope out longer term improvements

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Reference Information

- http://www.waterplan.water.ca.gov/cwpu2005
  - Chapter 4, Volume 1, Update 2005
- http://www.waterplan.water.ca.gov/tools
- http://www.waterplan.water.ca.gov/swan
- http://www.cwemf.org
  - Strategic Analysis Framework …

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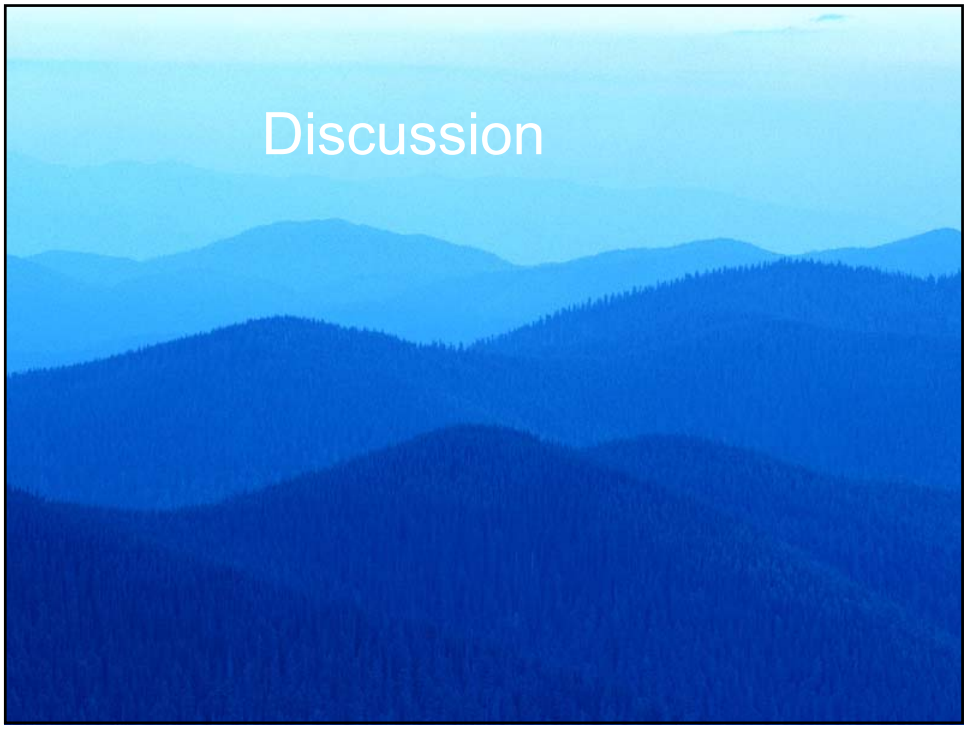
Discussion